The Maryland Fruit Grower

September, 1936

Maryland State
Horticultural Society

SPRAY RESIDUE INFORMATION FOR THE ORCHARDIST AND FRUIT PACKER, by R. H. Robinson and M. B. Hatch. Oregon Agricultural Experiment Station Bulletin 341. 1935.

Information on washing of fruit is becoming more important to Eastern growers and this bulletin from Oregon gives some timely material. Quoting from this bulletin:

"All varieties will form natural wax in varying amounts when the fruit is left in the orchard (after picking) or in common storage. The lead-arsenate particles become imbedded in the wax and are thus protected from the action of the washing solvent. Fruit should therefore be washed as soon as possible after picking. . . ."

Washing agents used in Oregon include hydrochloric acid and sodium silicate, supplemented by heating, if necessary, or addition of salt or wetting agents. Wetting or degumming agents are not of use in flood or spray type washers due to excess foaming. Only a few were found of promise. Outstanding in the experimental tests were the results secured by a combination of hydrochloric acid and oil. Petroleum oil of high purity (sulfonation test of at least 85 and viscosity of 40" to 55" Saybolt) was used at the rate of 1 to 2 gallons per 100 of acid solution and the solution had to be heated to 90—105°F. Poor results were secured if the fruit had little or no natural wax. This is a promising result secured with fruit very difficult to clean (original lead residue of 0.678 grains per pound reduced to .009 gr.).

Dual process machines are now in use in the northwest, involving the two washing units with two different solvents.

In operation of any washers this bulletin states, "The following important rules apply to all machines:

"1. Keep a full tank of washing solution in order that the maximum amount of solvent will be available for flooding the fruit. The flotation type washers require replenishment every few hours.

"2. Determine by titration the strength of acid or alkaline wash at least twice a day. If the washing solution is warmed by live steam, titrations should be made at least four times a day.

"3. An accurate thermometer conveniently placed should be used when the washing solutions are heated. Automatic thermal control is preferable.

"4. A good supply of fresh rinse water should be available and turned on full force. The rinse water is most important to prevent acid injury, arsenic burn and decay or mold spore contamination.

"5. Double layers of fruit or overloading of the machine should not be practiced. Double layers of heavily sprayed apples or pears cannot be cleaned.

"6. The washing solvent should be drained at intervals, depending upon the amount of fruit washed and the dirt that accumulates over a period of time."—Review by A. L. Schrader.

METHODS OF HEATING FRUIT WASHING SOLUTIONS, by H. J. Dana. Monthly Bulletin V. 18 (3) of Washington State College. (Engineering Bulletin 47). 1935.

With the increased use of apple washing equipment in the East to remove excess arsenic and lead residues, some problems in the efficiency of removal may involve heating of the wash solution. Growers in the northwest have used various homemade devices which are described and illustrated by sketches in this bulletin. More expensive commercial equipment also is described and illustrated. Heating with steam, electricity, and circulating coils is discussed. In constructing heaters, monel metal pipes were found practically acid-proof, but expensive. Steel pipe corrodes rapidly and copper is somewhat resistant.—Review by A. L. Schrader.

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SOME RESULTS OF EXPERIMENTS ON FRUITS AT THE EXPERIMENT STATION

By A. L. Schrader

The following summary has been submitted for publication in the Annual Report of the Maryland Agricultural Experiment Station. It is given here, to make the information immediately available to growers:

"During the past five years, cultivation of a young apple orchard without the incorporation of cover crops reduced the content of organic matter in a Sassafras gravelly loam nearly 20 per cent, and at the same time greatly increased soil erosion on the gentle slope. On the other hand disking under annual cover crops increased organic matter and slight or no erosion took place, according to the cover. Cover crops seeded June 1st competed strongly with three growth and the young trees were markedly smaller than trees with later covers or no covers. It would appear advisable to keep early cover crops at a distance from young trees, probably at least six feet.

Thinning of Concord grape clusters before blossoming, again in 1935 resulted in greatly improved size and compactness of cluster and, in this season, uniform ripening on a given vine in contrast to the uneven ripening of clusters on unthinned vines which also made harvesting difficult.

Peach pruning experiments in 1935 showed definitely that previous pruning treatment and growth responses from such treatments are of great importance in determining the relative amounts of cutting back and thinning that can be done with profit. *Thinning* cuts should be emphasized when tree growth is *dense and vigorous,* even though *cutting back* may seem most logical on upright branches. *Cutting back* should be emphasized on *leggy* trees with poor terminal growth. With changes in pruning, together with use of nitrogen fertilizers and borer control, larger peach trees of longer life are resulting. Consequently greater planting distance is necessary. On good soils it has been found that even with 24' x 24' distance, trees are becoming crowded at nine years of age. At the greater distances the trees produce much more fruit of better size and quality. With closer planting marketable size was not easily obtained in dry seasons.

Applying the results of shading experiments conducted with individual apple fruits, two weeks before harvest, it is probable that lack of sunny weather prior to harvest is of major importance in reducing *quality* of red color of apples. With a sky overcast with clouds during the day, the light intensity is reduced much below the intensity which seems necessary for red color development in apples. Even though area of red color is well developed, the quality of such color practically ceases to improve if shade is placed over the fruit, reducing light intensity to 40 per cent of normal.

Spacing of strawberry plants to limit the number of plants per square foot much less than the number in the usual matted row, resulted in increased yield and quality of berries, with several varieties that set plants profusely.

With some varieties spacing at 11" apart was definitely better than spacing at 7" apart. With extreme drouth conditions in the spring of the fruiting year, the spaced plants were much more drouth resistant than plants in matted rows.

New varieties of fruit under test are being fruited and are of great interest to growers. Lodi, an apple of Transparent type and season, looks very promising for Maryland conditions. Cumberland (white) and Valiant (yellow) are two peaches ripening just before and after Carman, respectively, which are hardy and productive of large, attractive fruits for the early season market. Fairfax and Dorsett are two new strawberries, highly productive and excellent quality, especially Fairfax as to quality.

Some new Hale crosses, fruiting in 1936 appear promising to furnish some large, attractive, white peaches of Carman season, as well as some yellow-fleshed peaches in Belle season, and following Elberta."

PARADICHLOROBENZENE-CRUDE COTTONSEED OIL EMULSION FOR THE CONTROL OF THE PEACH BORDER

In a mimeographed report by Oliver I. Snapp of the U. S. Department of Agriculture located at the Fort Valley, Georgia Field Station, it was reported that crude cottonseed oil with paradichlorobenzene applied as a spray around the base of peach trees had been found to be effective in the control of peach borers in nursery stock and young orchard trees. This treatment caused no injury to nursery stock or to 1-, 2-, or 3-year-old orchard trees. This treatment is claimed to be easy to apply and cheaper than the crystal treatment requiring less material and less time for application. Another asset claimed is that the soil around young trees need not be removed after the treatment. The spray has been found to kill eggs as well as the worm of the peach borer.

Preparation

The mixture is prepared by dissolving two pounds of paradichlorobenzene crystals in slightly warmed cottonseed oil. This mixture is then emulsified using good grade potash fish-oil soap at the rate of 1 pound of soap for each gallon of oil used. The resulting emulsion is a stiff, jelly like substance. The material should not be heated above 70° to 80° F. as heat will drive off the paradichlorobenzene. The emulsifying method consists of adding small quantities of the cottonseed oil-paradichlorobenzene mixture to the soap, stirring thoroughly before adding a little more to the mixture. After emulsifying the soap and oil mixture, water is added slowly with constant stirring until the total volume of the finished stock emulsion measures 2 gallons for each gallon of oil used at the start.

The appearance of free oil indicates that the mixture has not been properly emulsified. In this case, work the mixture over again, starting with a little more soap and repeatedly adding quantities of the mixture, thoroughly stirring each time as described above.

Size of Dose

The following dilution table gives the recommended quantities of spray to use on various aged trees, and the quantity of water necessary to dilute the

stock emulsion to get the required quantity of paradichlorobenzene in the spray applied to each tree.

Age of tree	Number of gallons of water to be added to each gallon of 50 per-cent stock emulsion	Quantity of diluted spray to apply to each tree	Quantity of paradich-lorobenzene applied by recommended dosage
Nursery trees	7	¼ pint	1/16 ounce
Orchard trees 1 to 2 yrs. old	7	½ pint	⅛ ounce
Orchard trees 3 yrs. old	3	½ pint	¼ ounce
Orchard trees 4 to 5 yrs. old	1	½ pint	½ ounce
Orchard trees 6 yrs. of age or older	1⅔	1 pint	¾ ounce

Time to Apply

This material is applied at the same time that the crystal treatment is recommended. September 15 to 30 is the recommended time for Western Maryland. October 1 to 15 is recommended for the Eastern Shore.

How to Apply

The emulsion should be applied under pressure around the base of the tree and on the lower part of the trunk. Care should be used in quantity applied since applications much in excess of the recommended doses may cause injury. A device for applying exact amounts of this material is manufactured by H. H. Weisel, Milford Square, Pa., and the Anthoine Machine Works, Fort Valley, Ga. A bucket spray pump may also be used for applying this emulsion, using known quantities for a tree.

No preparation of soil is necessary except to level it to prevent the liquid from running off and loosen it sufficiently to allow the soil to absorb it readily. If borers are working on the trunk above the ground level, a little soil thrown around the tree will help to bring the soil level up to where control will be obtained. After the material has been applied, several shovelfuls of soil should be placed against the trunk of the tree to prevent surface loss by evaporation. Removal of the mounds is not necessary until the following spring.

Some later work with PDB and oils is reported by S. C. Chandler of Illinois State Natural History Survey, reporting in Journal of Economic Entomology, August, 1936 (Vol. 29: No. 4). Using 10 year old peach trees, Chandler found that apparently, the *amount* of PDB applied was the main factor in borer control. He gives the following results:

Treatment	No. Seasons	No. Trees	Total Borers	Per Cent Dead
1 PDB crystals 1 oz. per tree	3	50	129	95.4
2 PDB in Dendrol 1 oz. to 1 pint	3	30	83	96.3
3 PDB in Scalecide 1 oz. to 1 pint	2	20	51	96.0
4 PDB in Soy bean oil, 1 oz. to 1 pint	2	20	34	91.1
5 Dichloropentane 1 oz. per tree	2	20	53	69.8
5 Dichloropentane 2 ozs. per tree	3	30	87	95.4
7 Check	3	35	103	2.9

The results (not shown here) with dilute solutions, indicated that control decreased where less than 1 ounce of PDB was applied to trees used in these tests.

The Entomology Department University of Maryland recommends PDB dosage as follows: Trees under 3 years old, ¼ oz. removing mounds in 2 weeks, trees 3-5 years old, ½ oz. removing mounds in 3 weeks; trees 6 years and over, 1 oz. leaving mounds over winter. Time of application: Eastern Shore, September 15-30; Western Maryland, October 1-15.

APPALACHIAN APPLES

The advertising plan incorporated as Appalachian Apples, designed to advertise apples grown in Virginia, West Virginia, Pennsylvania, and Maryland, is well under way, and promises to do some effective publicity in the apple market. At a meeting of the Directors, on September 4th, the sign-up was: Virginia, 1,549,000 bushels; West Virginia, 1,416,000 bushels; Pennsylvania, 1,288,000 bushels, and Maryland, 527,200 bushels. Maryland's sign-up was about 33% of the estimated commercial crop. There was prospect of considerably more fruit to be signed up, and prospects are that five million can be relied upon, giving a gross of $25,000.00, and a probable net budget of $19,000.00.

It was decided that hail injured fruit would be released from the sign-up if it was so badly injured that would not even grade Utility. The budget was revised, also, and includes funds for basket labels; newspaper articles, and photos; grocer-aid by direct visit to grocers, and chain stores, to help in window displays, and use of lithographs; recipe books for grocery counters; and encouragement of food shows and fair exhibits, the association furnishing advertising material and attendant, if the shows will furnish fruit displays and booth space. All in all, the plans for spending the money made available by the united efforts of growers are being carefully planned by a group of growers who are actively supporting this plan. Certainly, there will be no money wasted if it can be helped, and it is to be hoped that in time to come, a national apple advertising plan can be worked out by uniting of the present regional groups.

HAVE YOU READ THE ADVERTISEMENTS?

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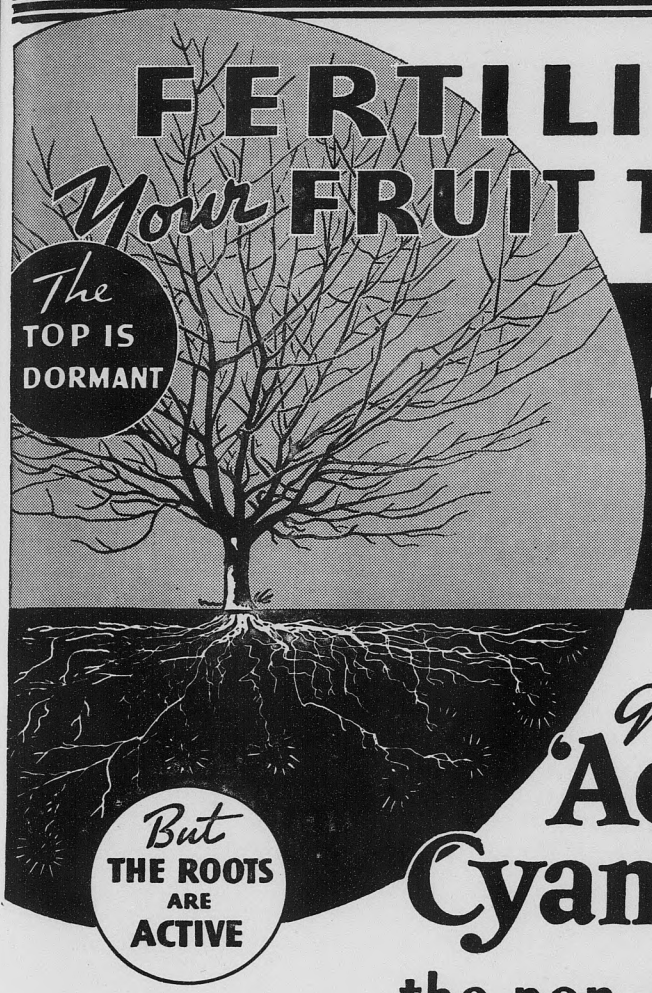

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SPRAY for PEACH BORERS!

Paradichlorbenzene

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Paradichlorbenzene dissolves readily in Scalecide. This combination is diluted with water 1 to 7 and sprayed about the ground and base of the trees. The best time for this application is in the Fall before the ground temperature is colder than 60°. One gallon of Scalecide and one pound of paradichlorbenzene will treat 40 or 50 full grown peach trees.

Substitute this inexpensive labor saving method of applying paradichlorbenzene with which growers are finding better control at less cost.

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